

FORM PTO-1390 (Modified)
(REV 11-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

11345.026001

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/623641

INTERNATIONAL APPLICATION NO.

PCT/IB99/00461

INTERNATIONAL FILING DATE

8 March 1999 (08.03.99)

PRIORITY DATE CLAIMED

06 March 1998 (06.03.98)

TITLE OF INVENTION

MULTIMEDIA TERMINAL ADAPTED FOR MULTIPLE USERS

APPLICANT(S) FOR DO/EO/US

REY, Francois

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

**Copy of the PCT Written Opinion dated December 10, 1999 (10.12.1999), 6 pages
Acknowledgement postcard**

EL521606960US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

INTERNATIONAL APPLICATION NO.

ATTORNEY'S DOCKET NUMBER

00/1223641

PCT/IB99/00461

11345.026001

21. The following fees are submitted..

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO) \$970.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$840.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$690.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$670.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$96.00

ENTER APPROPRIATE BASIC FEE AMOUNT =**\$840.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	17 - 20 =	0	x \$18.00	\$0.00
Independent claims	2 - 3 =	0	x \$78.00	\$0.00
Multiple Dependent Claims (check if applicable)			<input type="checkbox"/>	\$0.00
TOTAL OF ABOVE CALCULATIONS =				\$840.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).

☐**\$0.00****SUBTOTAL =****\$840.00**

Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).

\$0.00**TOTAL NATIONAL FEE =****\$840.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).

☒**\$40.00****TOTAL FEES ENCLOSED =****\$880.00**

Amount to be refunded	\$
charged	\$

☒ A check in the amount of **\$880.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **50-0591** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Jonathan P. Osha
Registration No. 33,986
ROSENTHAL & OSHA L.L.P.
700 Louisiana Street, Suite 4550
Houston, Texas 77002

Telephone (713) 228-8600
Facsimile (713) 228-8778

SIGNATURE

Jonathan P. Osha

NAME

33,986

REGISTRATION NUMBER

September 6, 2000

DATE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Francois REY

Art Unit:

Serial No.:

Examiner:

Filed: September 6, 2000

Title: MULTIMEDIA TERMINAL ADAPTED FOR MULTIPLE USERS

Box Patent Application

Assistant Commissioner for Patents

Washington, DC 20231



22511

PATENT TRADEMARK OFFICE

PRELIMINARY AMENDMENT

Dear Sir:

Before examining the referenced application on the merits, please amend the application as outlined below:

In the Claims:

In claim 3, line 1, please delete "or 2".

In claim 4, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 5, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 7, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 8, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 9, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 10, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 11, line 1, please delete "any preceding claim" and replace with -- claim 1--.

In claim 13, line 1, please delete "or 12".

In claim 14, line 1, please delete "any of claims 11 to 13" and replace with --claim

13--.

In claim 16, line 1, please delete "any preceding claim" and replace with -- claim 1--.

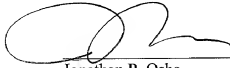
Please cancel claims 18 and 19.

REMARKS

The claims have been amended to remove multiple dependencies and to correct antecedent basis errors. Full examination and favorable action are requested.

Please charge any fees, or make any credits, to Deposit Account No. 500-591,
Reference No. 11345.026001

Date: 5/6/00


Jonathan P. Osha
Reg. No. 33,986

Rosenthal & Osha L.L.P.
700 Louisiana Street, Suite 4550
Houston, TX 77002

Telephone: 713/228-8600
Facsimile: 713/6228-8778

11345.026001.20000809.01.doc

MULTIMEDIA TERMINAL ADAPTED FOR MULTIPLE USERS

The present invention relates to a terminal for processing digital audio-visual or multimedia data.

- 5 Terminals of this kind are well-known in the field of pay TV systems, where a decoder or set-top-box receives broadcast digital multimedia data, including audiovisual program information, as well as data for generating on-screen menus, data for implementing gaming or shopping applications etc. Depending on the system, the data may be broadcast in scrambled or clear form.
- 10 Prior to the introduction of digital technology, decoders were connected to a limited number of devices, usually only an associated television display or, at maximum, a television display and a VHS recorder. The advent of digital technology has led to an explosion in the number of devices that may be connected to the decoder as well as the functionalities of the decoder. For example, in addition to a Peritel analogue output to a TV and VHS device, the decoder may also include a connection via a
- 15 digital bus, such as the IEEE 1394 bus, to other digital devices such as a DVD recorder, a PC etc.
- As a complement to the increase in the number of external devices that may be connected to the decoder, there has been an increase in the number of modes of operation of a device. For example, in the standard set up of decoder and television, the decoder may be used either to simply supply
- 20 television broadcast information, or to provide a connection to the internet.
- In evolving away from the traditional analogue system, the architecture of presently known digital decoders has nevertheless tended to follow the preconceptions guiding their design. In particular, the architecture of standard decoders does not accurately reflect the role of a terminal in routing data
- 25 between many external devices in parallel, the modes of operation of the decoder and the number of users of the system that may exist.
- According to the present invention, there is provided a terminal for processing digital audio-visual or multimedia data including a data processing system and a memory, characterised in that the data

processing system stores in the memory user profile data relating to the characteristics or preferences of a plurality of types of user of the terminal.

The definition of a user profile enables the processing system to flexibly treat and handle a number of users of the terminal. As will be appreciated, whilst a user profile may be associated with the connection of an external device or the personal identity of the operator accessing the terminal it is preferably associated with a mode of operation, for example, internet mode or television mode.

A user profile may also further be personalised for one or more operators. For example, after defining a user profile for the internet mode of operation of the terminal, it may be possible to define a first internet operator having certain rights and a second operator having other rights.

Advantageously, the user profile data includes resource data indicating the resources within the terminal accessible by each user. In the case of a decoder terminal, these resources may include rights of access to the demultiplexer to determine the data downloaded from the broadcast data stream etc.

Further advantageously, the user profile data includes priority data indicating the priority of each user in respect of access to one or more resources of the terminal. For example, for a decoder terminal, the user profile data may include a priority level indicating the priority of a particular user in accessing the demultiplexer. Conflicting channel demands between, for example, a TV device user and a recorder device user can thereafter be resolved by a management application based on this information.

In addition to resource data indicating the terminal resources available to a given device, the user profile data may further comprise data relating to the attributes of information to be supplied to each user. These attributes may include, for example, an indication of the language to be used in all graphical interface displays for that user.

In addition, the user profile data may further include data relating to the actions permitted by each user, such as whether a given user may change the demux channel etc. Although closely related to the resource data described above, this data may be used to define the parameters of the operations permitted by each device having access to a given resource.

Preferably, some or all of the characteristics or preferences of the user profile data may be modified during normal operation of the terminal by an operator. For example, the relative priority values of each user in accessing data may be modified by a viewer to give a VHS recorder output priority over a television output, or an internet connection priority over the television etc. In addition, or alternatively, some or all of the user profile data may be predetermined by the data processing system of the terminal.

The present invention is particularly adaptable to a terminal comprising a data processing system comprising, inter alia, a virtual machine and an object oriented application interface layer comprising a plurality of class libraries.

In particular, the application interface layer may comprise one or more class libraries defining the operation of the virtual machine with respect to user profile data. These classes may include, for example, a class library dedicated to management of user profile data in the memory cache of the terminal. Equally, the classes may include one or more user profile class libraries to define the characteristics of the data to be stored in the user profiles. For example, a method class may be used to define the attributes of the preferred language to be stored in the user profile.

The behaviour of classes within the application interface layer will depend on the language chosen. In the case of an application interface written in Java, for example, a single inheritance structure may apply between a class and its subclasses.

In one embodiment, the user profile classes may include a generic class library associated with the definition of generic characteristics of user profile data, and one or more sub-class libraries associated with the definitions of characteristics associated with a specific user profile.

The present invention is particularly applicable to a terminal in the form of a decoder adapted to receive data transmissions in a digital transmission system.

- 5 The present invention may equally extend to a method of operation of a terminal.

The term "decoder" may describe a receiver for receiving either encoded or non-encoded signals, for example, television and/or radio signals. Embodiments of such a decoder may include a decoder integral with the receiver for decoding the received signals, for example, in a "set-top box", such a decoder
10 functioning in combination with a physically separate receiver, or a decoder integrated with additional elements, such as a web browser or a video recorder or a television.

As used herein, the term "digital transmission system" includes any transmission system for transmitting or broadcasting for example primarily audiovisual or multimedia digital data. Whilst the present invention
15 is particularly applicable to a broadcast digital television system, the invention may also be applicable to a fixed telecommunications network for multimedia internet applications, to a closed circuit television, and so on.

There will now be described, by way of example only, a preferred embodiment of the invention in
20 which:

Figure 1 shows a digital television system including a multimedia terminal in the form of a decoder;

Figure 2 shows the physical elements of the decoder of Figure 1;

Figure 3 shows the software architecture of the data processing system within the decoder;

Figure 4 shows the structure of the virtual machine used in the data processing system of Figure 3;

Figure 5 shows a set of predetermined user profiles to be defined in this embodiment of the invention;

Figure 6 shows the elements of user profile data stored in the decoder memory for each of the user profiles of Figure 5; and

- 5 Figure 7 shows the structure of class libraries within the application interface layer of the software architecture to be used in the definition of the user profiles.

An overview of a digital television system 1 according to the present invention is shown in Figure 1. The invention includes a mostly conventional digital television system 2 that uses the known MPEG-2 compression system to transmit compressed digital signals. In more detail, MPEG-2 compressor 3 in a broadcast centre receives a digital signal stream (typically a stream of video signals). The compressor 3 is connected to a multiplexer and scrambler 4 by linkage 5.

The multiplexer 4 receives a plurality of further input signals, assembles the transport stream and transmits compressed digital signals to a transmitter 6 of the broadcast centre via linkage 7, which can of course take a wide variety of forms including telecommunications links. The transmitter 6 transmits electromagnetic signals via uplink 8 towards a satellite transponder 9, where they are electronically processed and broadcast via notional downlink 10 to earth receiver 12, conventionally in the form of a dish owned or rented by the end user. The signals received by receiver 12 are transmitted to an integrated receiver/decoder 13 owned or rented by the end user and connected to the end user's television set 14. The receiver/decoder 13 decodes the compressed MPEG-2 signal into a television signal for the television set 14.

Other transport channels for transmission of the data are of course possible, such as terrestrial broadcast, cable transmission, combined satellite/cable links, telephone networks etc.

In a multichannel system, the multiplexer 4 handles audio and video information received from a number of parallel sources and interacts with the transmitter 6 to broadcast the information along a corresponding number of channels. In addition to audiovisual information, messages or applications

or any other sort of digital data may be introduced in some or all of these channels interlaced with the transmitted digital audio and video information.

A conditional access system 15 is connected to the multiplexer 4 and the receiver/decoder 13, and is located partly in the broadcast centre and partly in the decoder. It enables the end user to access digital television broadcasts from one or more broadcast suppliers. A smartcard, capable of deciphering messages relating to commercial offers (that is, one or several television programmes sold by the broadcast supplier), can be inserted into the receiver/decoder 13. Using the decoder 13 and smartcard, the end user may purchase commercial offers in either a subscription mode or a pay-per-view mode. In practice, the decoder may be configured to handle multiple access control systems, e.g. of the Simulcrypt or Multicrypt design.

As mentioned above, programmes transmitted by the system are scrambled at the multiplexer 4, the conditions and encryption keys applied to a given transmission being determined by the access control system 15. Transmission of scrambled data in this way is well known in the field of pay TV systems. Typically, scrambled data is transmitted together with a control word for descrambling of the data, the control word itself being encrypted by a so-called exploitation key and transmitted in encrypted form.

The scrambled data and encrypted control word are then received by the decoder 13 having access to an equivalent of the exploitation key stored on a smart card inserted in the decoder to decrypt the encrypted control word and thereafter descramble the transmitted data. A paid-up subscriber will receive, for example, in a broadcast monthly ECM (Entitlement Control Message) the exploitation key necessary to decrypt the encrypted control word so as to permit viewing of the transmission.

An interactive system 16, also connected to the multiplexer 4 and the receiver/decoder 13 and again located partly in the broadcast centre and partly in the decoder, enables the end user to interact with various applications via a modem back channel 17. The modem back channel may also be used for communications used in the conditional access system 15. An interactive system may be used, for

example, to enable the viewer to communicate immediately with the transmission centre to demand authorisation to watch a particular event, download an application etc.

Referring to Figure 2, the physical elements of the receiver/decoder 13 or set-top box adapted to be used in the present invention will now be described. The elements shown in this figure will be described in terms of functional blocks.

The decoder 13 comprises a central processor 20 including associated memory elements and adapted to receive input data from a serial interface 21, a parallel interface 22, and a modem 23 (connected to the modem back channel 17 of Fig 1).

The decoder is additionally adapted to receive inputs from an infra-red remote control 25 via a control unit 26 and from switch contacts 24 on the front panel of the decoder. The decoder also possesses two smartcard readers 27, 28 adapted to read bank or subscription smartcards 29, 30 respectively. Input may also be received via an infra-red keyboard (not shown). The subscription smartcard reader 28 engages with an inserted subscription card 30 and with a conditional access unit 29 to supply the necessary control word to a demultiplexer/descrambler 30 to enable the encrypted broadcast signal to be descrambled. The decoder also includes a conventional tuner 31 and demodulator 32 to receive and demodulate the satellite transmission before being filtered and demultiplexed by the unit 30.

Processing of data within the decoder is generally handled by the central processor 20. The software architecture of the central processor corresponds to a virtual machine interacting with a lower level operating system implemented in the hardware components of the decoder.

DECODER SYSTEM ARCHITECTURE

Turning now to the architecture of the system within the receiver/decoder shown in Figure 3, it will be seen that a layered architecture is used. The first layer 41 represents the operating system of the hardware of the receiver/decoder. This is a real-time operating system chosen by the manufacturer to control the hardware elements of the receiver/decoder. The real-time operating system has a relatively fast response

time in order to be able to correctly synchronise hardware operations. Event messages are passed between this layer and the middleware layer 42 immediately above.

The data processing system sits on top of the hardware operating system and comprises a middleware layer 42 and an application interface layer 43.

The middleware layer 42 is written in a language such as C ANSI and comprises the elements of a virtual machine 44 and a number of interfaces 45 including a graphical interface 46, a FLASH/PROM memory interface 47, a protocol interface 48 and a device interface 49.

The present invention uses a virtual machine in order to provide independence between upper level applications and the lower level operating system implemented by the set top box manufacturer. The interfaces 45 provide the link between operations of the virtual machine and the lower level operating system 41 and also include a number of intermediate level application modules more easily executed at this level.

The application interface (API) layer 43 comprises a number of high level packages 50-55, written in an object-oriented interpretative language, such as Java. These packages provide an interface between the applications created by the service provider (interactive program guide, teleshopping, internet browser etc) and the virtual machine of the system. Examples of such applications are given below.

The lower level OS is normally embedded in the hardware components of the decoder, although in some realisations, the lower level OS can be downloaded. The middleware and application interface layer packages can be downloaded into the RAM or FLASH memory of the decoder from a broadcast transmission. Alternatively, some or all of the middleware or application interface layer elements can be stored in the ROM or (if present) FLASH memory of the decoder. The decoder may even include a hard disc or DVD drive for memory storage purposes. As will be understood, the physical organisation of the memory elements of the decoder is distinct from the logical organisation of the memory.

APPLICATION INTERFACE LAYER

Referring to the application interface layer 43 shown in Figure 3, and as described above, the packages in this layer are written with an object oriented language such as Java. Each package defines a set of class libraries called on during operation of the system. In the present system the following packages are installed.

Lang/util Package 50. This package defines the classes necessary for the manipulation of objects by the virtual machine. These class libraries normally form part of a standard library associated with the object oriented language chosen.

MHEG-5 Package 51. This package defines the classes associated with the manipulation of graphical objects on the television display. Such objects are distinct from audio-visual data and can make up, for example, channel identifiers or text laid over displayed images. The definition of classes within this package should respect the MHEG-5 norms defined by the standards ETS 300777-3 and ISO/IE 13522-5 (and the standard ISO/IE 13522-6 in the case of a Java implemented system).

Toolbox Package 52. This package contains the classes used for downloading and decompression of information as well as the classes associated with the management of the file system and memory within the receiver/decoder and the classes associated with the connection to the internet etc.

Device Package 53. This package defines the classes necessary for management of peripherals attached to the receiver/decoder, as discussed above and including the modem, the smart card readers, the MPEG flow tuner etc.

Service Package 54. This package defines the classes necessary for the implementation of developing higher level interactive applications, such as management of credit card data etc.

DSMCC-UU Package 55. This package implements the protocols necessary for communication between a client and a server for data file search and reading. Implementation of this package should respect the norm ISO/IEC 13818-6 and directives defined in DAVIC part 9.

- 5 In normal operation, a further layer of interactive applications, written by the service provider and downloaded during broadcast as in conventional systems, will be laid over the interface packages defined above. These applications typically include a general application manager for managing the defined basic operations of the decoder, and one or more optional applications adding additional services. In particular, a user manager application may be used to manage user priority conflicts, as will be described below.

10

Depending on the applications to be introduced, some of the above packages may be omitted. For example, if the service provider does not intend to provide a common way for data reading, the DSMCC-UU package may be left out of the final system.

- 15 The packages 43 provide class libraries for an object-oriented programming environment. Their class behaviour will depend on the language chosen. In the case of a Java application, for example, a single inheritance class structure will be adhered to.

As will be understood, the grouping of a class or a set of classes in a package is a matter of formalism

- 20 with respect to the functionality of a class. Certain classes related to management of peripheral devices may be, for example, classified either as belonging to the Device Package 53 or the Service Package 54.

INTERFACE LAYER

- 25 As shown, the interface layer is composed of four modules, a graphics module 46, a memory file management module 46, a protocol module 48 and a device manager 49. Whilst the modules at this level are described as interface modules their function is to provide a "glue" layer for the implementation of the application interface packages and for the operation of the virtual machine generally.

The graphics module 46, for example, provides the creation and management of graphical objects. It asks the low level OS to display basic graphic shapes such as single pixels, lines, rectangles etc. The implementation of this module depends on the graphics capability of the low level manufacturer's OS. In some ways complementary to the MHEG-5 package 51, these functions may be more efficiently executed at this code level than in the high level code chosen for the application layer above.

In a similar manner, the memory file management module 47 includes low level read/write file commands associated with the memory components of the system. Typically, the hardware operating system only includes commands necessary to read/write a sector or page within a memory component. As with the graphics module 46, this module enables a set of simpler lower level applications to be efficiently introduced in the system.

The protocol management module 48 defines a library of communication protocols that may be called upon in communications via, for example, the TCP/IP layer of the decoder.

The device manager 49 is slightly different from the other modules in this layer in that it provides the link or interface between the hardware operating system and the layers above, including the other modules in the interface layer and the virtual machine. Commands or event messages that are received/sent to the hardware OS from the virtual machine, for example, are necessarily passed by the device manager for conversion according to the interface specifications between the two levels.

VIRTUAL MACHINE DESCRIPTION

Referring now to Figure 4, the structure of the virtual machine 44 used in the system of the present invention will be described. The virtual machine used in the present invention is a pre-emptive multithread type machine. The general characteristics of such a machine are known in other contexts and the creation of code for implementation of such a machine will be within the scope of one skilled in the art.

The virtual machine is composed of a number of elements, which interact broadly as shown in Figure 4.

The scheduler 60, composed of a thread manager service 61 and a monitor manager service 62, forms

the heart of the multithread machine. The scheduler 60 orders the execution of threads created by applications externally of the virtual machine and those created by the virtual machine itself (e.g. a garbage collection thread as discussed below).

- 5 The event manager 63 handles an event routing table and the lists of events subscribed to by the threads and centralises the dispatch of event treatments.

The memory manager 64 handles the allocation and deallocation of the memory zones within the system memory and also handles the removal from the memory of non-referenced objects (garbage collection).

10

The class manager 65 charges the classes of the application code downloaded in a broadcast signal, interacting with the security manager 66 to check the integrity of downloaded code and with the file manager 68, which implements the applications.

- 15 The file manager 68 carries out the implementation of the system files and the handles the mechanism of downloading of interactive applications and data.

The security manager 66 handles the level of access permitted to downloaded applications, some applications having the ability to carry out more operations than others in relation to the file system.

20

The interpreter 67 comprising a bytecode interpretation service 69 and a "m-code" interpretation service 70 handles the interpretation of applications written in these two codes, bytecode being associated with Java applications and m-code being the name given to a proprietary code developed by the applicants.

25 USER PROFILES

The increasing hardware processing power available in decoders has led to the increasing use of decoders in the routing of information between a number of potential users of the system. For example, a single IRD can serve as the input point for a broadcast MPEG stream, this stream being processed and

diverted to one or more connected television displays, an analogue VHS recorder connected via a Peritel link, a PC or DVD device connected via an IEEE 1394 bus etc.

An idea central to the present embodiment is the definition of a number of "users" of the decoder, each user having a certain characteristic profile. For example, a high level application may define a number of user profiles for a television viewer, a VHS recorder, a person directly using the decoder to access to the internet, a person using the decoder to route information to a PC etc. Figure 5 shows an example of a set of typical user profiles. This list may be expanded to include, for example, a DVD device connected to the decoder etc.

A user profile may be defined in relation to an external device connected to terminal, for example the connection television, where the terminal simply supplies audiovisual data to the television display.

The user profile may also be defined in relation to the actual identity of one or more physical persons or "operators" accessing the terminal.

In the present case, however, a user profile is defined in relation to a mode of operation of the device, such as its operation in an internet mode. Each user profile defined for one set up or mode of operation may be personalised for the different persons using the decoder terminal. For example, one person may have different viewing preferences from another, or may be prohibited from watching certain channels. The information regarding the preferences of each person is stored within the user profile for that mode of operation.

Each user profile will have a unique and characteristic user ID and one or more priority values determining the priority of this user in obtaining one or more decoder resources. In this case, the term "resources"

refers to a functionality of the decoder such as access to the demultiplexer to download selected data.

The high level application manager defines and stores the characteristics of these profiles and handles the sharing of resources and user conflicts with reference to the user priority.

For example, a user manager may give priority to a user "RECORDER" for example, such that a demand by this user to use a given resource will take priority over a demand by the user "VIEWER" to use that

resource. In particular, the user "RECORDER" may have preference over the user "VIEWER" as far as choice of demux channel is concerned. In this way, the application prevents a change channel signal received from a viewer from taking priority over the channel chosen by someone wishing to record a program being transmitted at the same time.

5 In this example, where a single priority value is assigned to each user, the user "RECORDER" will always take priority over "VIEWER" for access to any resource. Alternatively, multiple priority values may be assigned, such that "VIEWER" has priority for certain resources, "RECORDER" priority for others etc.

10 The priority evaluation is handled by the user manager and may be interactive, i.e. an operator may determine by programming the decoder with the handset whether to give priority to an internet connection over television viewing etc.

Each user profile includes, in addition to the user ID value, a set of preferences stored in a cache memory 15 in the decoder, for example, in the FLASH memory of the decoder. These preferences will be called up by the application upon at each booting up of the decoder. As shown in Figure 6, user profile data 80 includes resource data 81, attribute data 82, and action data 83.

The resource data 81 includes a list of internal decoder resources that may be accessed by the user, 20 for example, access to the MPEG tuner and descrambler. As will be understood, a resource in this context refers to a logical resource relating to a combination of physical elements associated with a demux process, a conditional access system etc.

Attribute data 82 includes preferred attributes specific to that user, for example, the language (English, 25 French, German etc.) that will be preferentially used in written displays on the screen, the morality level of programmes that can be viewed by the user etc. The action data 83 includes a list of permitted actions that may be carried out by that user, including change channel etc.

The user profile data can include fixed values predetermined by the user manager (for example, all users 30 are capable of accessing the resources of the tuner, the demultiplexer etc.) as well as values modifiable

by and personalised to each operator capable of using the terminal in each operating mode (morality level of programmes that may be watched etc.).

Values modifiable by an operator can include values for each user profile set by an operator at the moment of start-up of the decoder as well values set by an operator each time a session is started with a particular user profile.

The definition of multiple user profiles corresponding to modes of operation and including data regarding priority to terminal resources for each profile paves the way for parallel processing of such modes by the terminal so as to permit, for example, a single terminal to handle and process data for viewing via a television at the same time as forwarding different data to be recorded by an associated recording device, treated by a PC etc. In such systems the terminal becomes effectively a data hub for a number of associated peripheral devices operating in parallel. This sort of operation is particularly well managed by a multithread system of the kind shown in relation to Figures 3 and 4, and as will now be described.

In order to permit the creation of a series of user profiles, it is desirable to include within the API layer object classes adapted to engage with the virtual machine to achieve this. Referring back to Figure 3, and as discussed above, the class libraries defined in the API layer 43 supply the parameters of operation within which the higher level applications may operate. In particular, in carrying out certain actions, a high level application will include instructions referring to classes of objects defined in this layer.

Each class will respect the rules of the object oriented programming language chosen for this layer. Typical object classes include classes relating to the management of the ports of the decoder, such as the credit card interface, as well as other operations such as management of the access control system. A number of standard classes in the API layer have been defined by the DAVIC group in relation to, for example, access to sections and tables in a downloaded MPEG stream.

There will now be described, with reference to Figure 7, a structure of classes adapted to provide the possibility of defining user preferences for each such user and to facilitate the handling of multiple users

by a high level application. The classes that will be described may be included, for example, in the Service Package 54 installed in the API layer 43.

Referring to Figure 7, a class UserCacheManager shown at 90 is used to permit applications to access and manage user profile data stored in the memory cache of the system. This class is a static class. As with standard object oriented program architectures, the class library includes a list of methods or commands such as a method initialise() to initialise the memory cache, a method getMaxUserProfiles() to know the maximum number of users to be supported by the system, a method getActiveUserID() to know the number of users currently active etc. The class may also be associated with a list of events, signalling to the application the occurrence of an event, such as the creation or deletion of a user profile.

The classes additionally include a class UserProfile shown at 91. This class is a generic class, adapted to permit the creation of a number of user profiles. The class includes a list of methods such as getUserID() to recover the identity of a user, getPriorityLevel() to recover the priority of access to resources, setGeneralAttribute() to set the value of a general attribute etc. The class is also associated with a list of events indicating, for example, a change of channel demanded by a user etc.

These methods are methods which permit an indirect access to methods, thereby avoiding the necessity of having a method for each attribute. The number of attributes managed by these methods will depend on the choice of the system architect and may evolve with time.

In practice, the choice and functionality of the number of methods in this and the other classes may also be determined at the discretion of the system architect and in dependence on the processing power of the hardware, the characteristics of the virtual machine, the number of functionalities the system architect wishes to introduce etc.

As will be described, some of the methods may be inherited by other classes in accordance with the principles of the object oriented language chosen for the application interface layer.

In particular, the classes ViewerProfile 92, RecorderProfile 93, InternetProfile 94, DataBridgeProfile 95, define methods specific to the definition of the user profile VIEWER, RECORDER, INTERNET, DATA_BRIDGE etc. The classes 92 to 95 may include methods inherited from the generic UserProfile class 91. For example, using the command setGeneralAttribute (Attribute, Value of Attribute), the preferred value of an attribute associated with the user profile in question may be determined.

Taking the case of a viewer profile in which the morality level of a viewer is to be defined, the instruction

setGeneralAttribute (Morality-Level, 18)

in the context of programming the profiles for the user VIEWER will set an authorised age limit for this user. This value will be defined and called up by a higher level application and can be used to prevent access by the user VIEWER to certain demux channels, unless the operator declares his age. For each person having access to the decoder in the mode VIEWER, a set of preferences may thus be defined by instances within the class VIEWER.

As will be understood, the definition in the API of a number of classes specific to the creation of an identified "user" enables the system to easily define a plurality of user profiles for each of these users. The provision of a class UserCacheManager permits the handling of cached profile data relating to a user, whilst the generic classes UserProfile and the sub-classes ViewerProfile, RecorderProfile etc. provide the tools necessary for the definition of each user profile.

The exact composition and definition of the methods and events within these classes is however discretionary and it will be within the competence of one skilled in the art to determine the best definition of such objects in dependence on the characteristics of the chosen virtual machine etc.

CLAIMS

1. A terminal for processing digital audio-visual or multimedia data including a data processing system and a memory, characterised in that the data processing system stores in the memory user profile data

5 relating to the characteristics or preferences of a plurality of types of user of the terminal.

2. A terminal as claimed in claim 1, where the user profile is defined in relation to a mode of operation of the terminal.

10 3. A terminal as claimed in claim 1 or 2, where the user profile is defined in relation to the connection of an external device.

4. A terminal as claimed in any preceding claim, where a user profile is personalised in relation to the identity of the operator.

15 5. A terminal as claimed in any preceding claim, where the user profile data includes resource data indicating the resources within the terminal accessible by each user.

20 6. A terminal as claimed in claim 5 where the user profile data includes priority data indicating the priority of each user in respect of access to one or more resources of the terminal.

7. A terminal as claimed in any preceding claim where the user profile data comprises data relating to the attributes of information to be supplied to each user.

25 8. A terminal as claimed in any preceding claim where the user profile data comprises data relating to the actions permitted by each user.

9. A terminal as claimed in any preceding claim where some or all of the characteristics or preferences of the user profile data are modifiable during normal operation of the terminal by an operator.

10. A terminal as claimed in any preceding claim where some or all of the user profile data is predetermined by the data processing system of the terminal.

11. A terminal as claimed in any preceding claim where the terminal comprises a data processing system
5 comprising, inter alia, a virtual machine and an object oriented application interface layer comprising a plurality of class libraries.

12. A terminal as claimed in claim 11, in which the application interface layer may comprise one or more class libraries defining the operation of the virtual machine with respect to user profile data.

10 13. A terminal as claimed in claim 11 or 12, in which the application interface layer comprises a class library dedicated to memory management of user profile data in the memory cache of the terminal.

14. A terminal as claimed in any of claims 11 to 13 in which the application interface layer comprises one
15 or more user profile class libraries adapted to define the characteristics of the data to be stored in the user profiles.

15. A terminal as claimed in claim 14, in which the user profile class libraries comprise a generic class
library associated with the definition of generic characteristics of user profile data, and one or more sub-
20 class libraries associated with the definitions of characteristics associated with a specific user profile.

16. A terminal as claimed in any preceding claim comprising a decoder adapted to receive data transmissions in a digital transmission system.

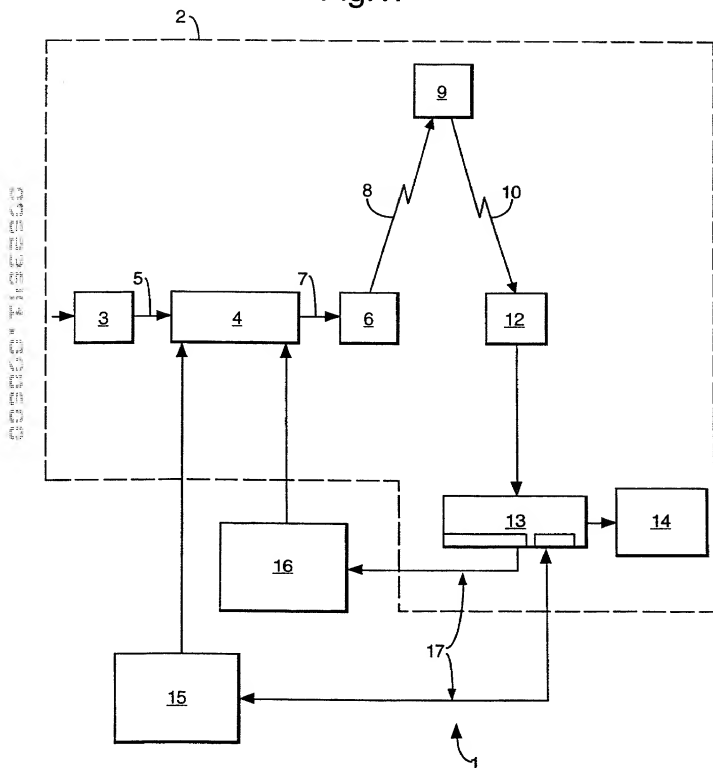
25 17. A method of operation of a terminal for processing digital audio-visual or multimedia data including a data processing system and a cache memory characterised by the step of storing in the terminal memory user profile relating to the characteristics or preferences of plurality of users of the terminal.

18. A terminal for processing digital audio-visual or multimedia data substantially as herein described.

19. A method of operation of a terminal for processing digital audio-visual or multimedia data substantially as herein described.

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1189
1190
1191
1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1798
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1810
1811
1812
1813
1814
1815
1816
1817
1818
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
2174
2175
2176
2177
2178
2179
2180
2181
2182
2183
2184
2185
2186
2187
2188
2189
2190
2191
2192
2193
2194
2195
2196
2197
2198
2199
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213

Fig.1.



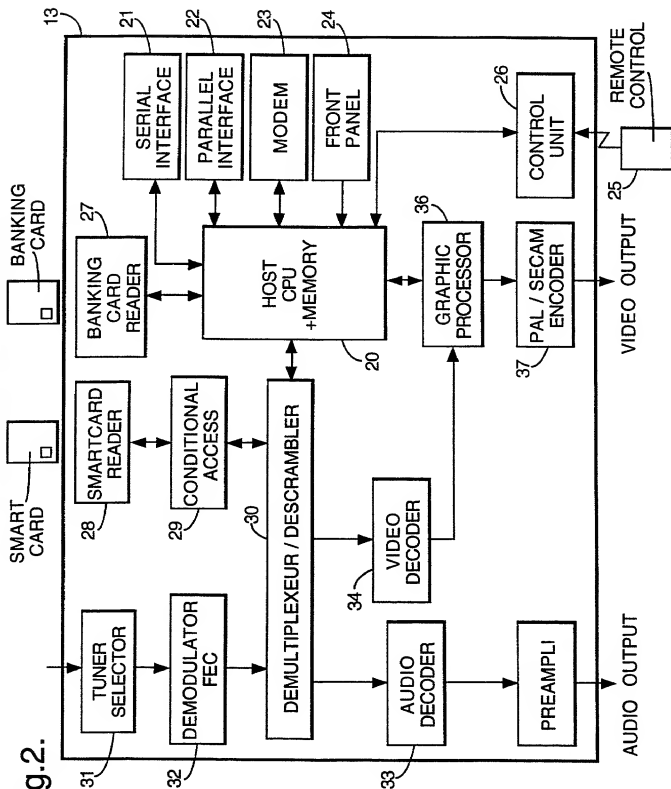
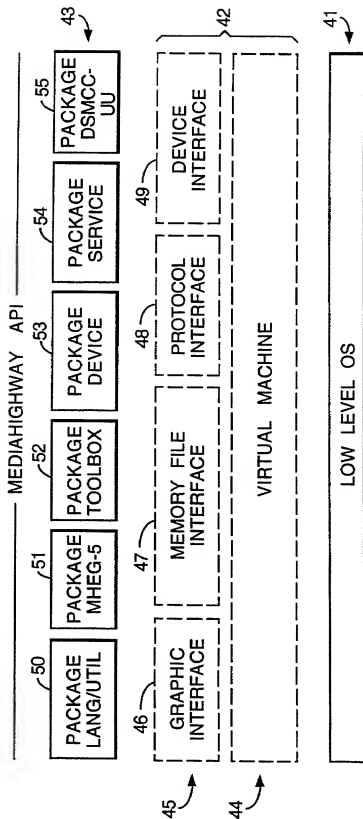
[illegible]

Fig.3.



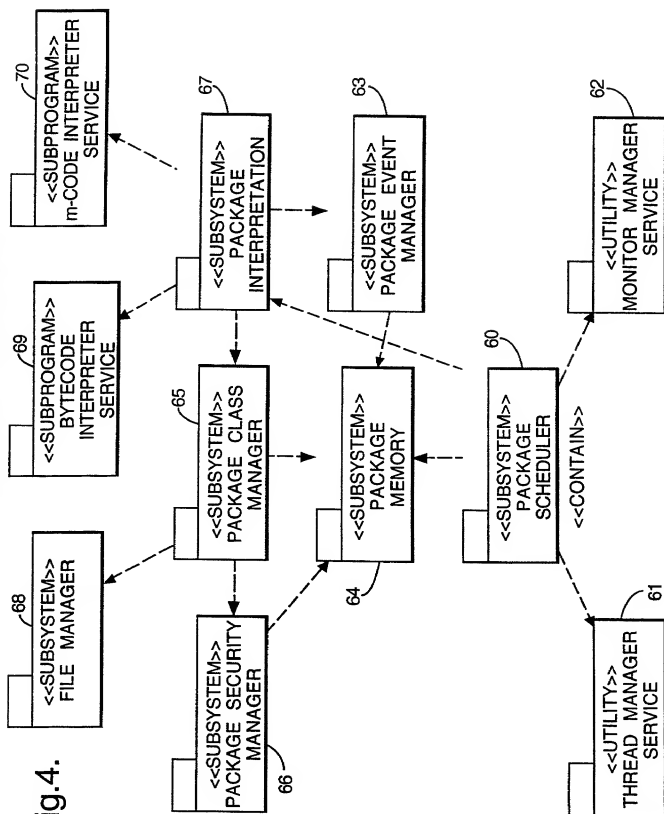


Fig.5.

Profile	Definition
VIEWER	Traditional user
RECORDER	System user recording on VHS device
INTERNET	User connecting to Internet
DATA_BRIDGE	System user routing information to PC

Fig.7.

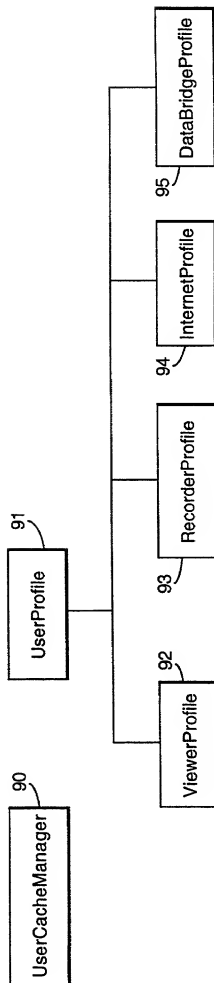
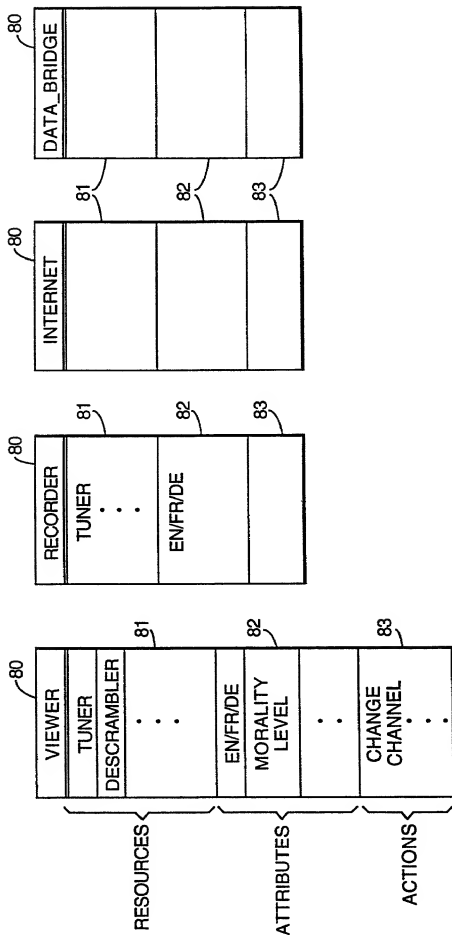


Fig.6.



Declaration and Power of Attorney for Patent Application

Déclaration et Pouvoirs pour Demande de Brevet

French Language Declaration



22511

PATENT TRADEMARK OFFICE

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

As a below named inventor, I hereby declare that:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

My residence, post office address and citizenship are as stated next to my name.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MULTIMEDIA TERMINAL ADAPTED FOR MULTIPLE USERS

et dont la description est fournie ci-joint à moins que la case suivante n'ait été cochée:

the specification of which is attached hereto unless the following box is checked:

☐ a été déposée le _____ sous le numéro de demande des Etats-Unis ou le numéro de demande international PCT

☐ was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

_____ et modifiée le _____ (le cas échéant).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

Prior foreign application(s)
Demande(s) de brevet antérieure(s)

98400541.3
(Number)
(Numéro)

European
(Country)
(Pays)

6 March 1998
(Day/Month/Year Filed)
(Jour/Mois/Année de dépôt)

Priority Not Claimed
Droit de priorité revendiqué



(Number)
(Numéro)

(Country)
(Pays)

(Day/Month/Year Filed)
(Jour/Mois/Année de dépôt)



Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.)
(N° de demande)

(Filing Date)
(Date de dépôt)

(Application No.)
(N° de demande)

(Filing Date)
(Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont j'ai pu disposer entre la date de dépôt de la demande antérieure et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

PCT/IB99/00461
(Application No.)
(N° de demande)

8 March 1999
(Filing Date)
(Date de dépôt)

Pending
(Status) (patented, pending, abandoned)
(Statu) (breveté, en cours d'examen, abandonné)

(Application No.)
(N° de demande)

(Filing Date)
(Date de dépôt)

(Status) (patented, pending, abandoned)
(Statu) (breveté, en cours d'examen, abandonné)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec l'Office des brevets et des marques: (mentionner le nom et le numéro d'enregistrement).

Adresser toute correspondance à:

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number).

Send Correspondence to:

Jonathan P. Osha, Reg. No. 33,986; Adenike Adewuya, Reg. No. 42,254
 Alan D. Rosenthal, Reg. No. 27,833; Y. Renee Alsandor, Reg. No. 45,883
 Richard A. Fagin, Reg. No. 39,182; Jeffrey S. Bergman, Reg. No. 45,925
 K. KaRan Reed, Reg. No. 45,036; Scott W. Hejny, Reg. No. 45,882
 David E. Mixon, Reg. No. 43,809; Thomas K. Scherer, Reg. No. 45,079

Adresser tout appel téléphonique à: (nom et numéro de téléphone)

Direct Telephone Calls to: (name and telephone number)

Jonathan P. Osha
 (713) 228-8600

Nom complet de l'unique ou premier inventeur	Full name of sole or first inventor
Signature de l'inventeur	Inventor's signature
Date	Date
Domicile	Residence
Nationalité	Citizenship
Adresse postale	Post Office Address
Nom complet du second co-inventeur, le cas échéant	Full name of second joint inventor, if any
Signature du second inventeur	Second Inventor's signature
Date	Date
Domicile	Residence
Nationalité	Citizenship
Adresse postale	Post Office Address

(Fournir les mêmes renseignements et la signature de tout (Supply similar information and signature for third and subsequent joint inventors.)